

## Revalorización de saberes ancestrales para la siembra de quinua (Bolivia, Plurinational State of)

### DESCRIPTION

En la zona se está implementando el uso de maquinaria pesada, lo que provoca la degradación del suelo en la producción de quinua. A partir de ello, se quiere utilizar los saberes ancestrales (uso de tecnología mixta, saberes locales e innovación tecnológica) como una alternativa para mitigar la degradación de los suelos y la baja productividad del cereal (quinua).

En la comunidad de Copacana el período de siembra es desde el 15 de septiembre hasta el 10 de octubre. Antes de la siembra, la autoridad originaria junta a la comunidad y se hace un ritual de agradecimiento a la Pacha Mama, pidiendo el permiso para la siembra y una buena producción. cada familia se junta en las parcela, también los hijos, y siembran su parcela. La siembra manual consiste en hacer surcos manuales buscando la humedad y dejando unas diez semillas en cada hoyo, y cubriéndolo con una capa de 4 cm de tierra, manualmente, e irrigando directamente en hoyo. Al final, se cubre con una pajita para proteger la semilla del sol y de la evaporación del agua

Propósito de la tecnología: 1. Revalorización de saberes ancestrales para la producción de quinua.

2. Mitigación o reducción de la degradación (mitigación/ reducción).

3. Prevención de la degradación.

Ambiente natural / humano: Altiplano boliviano.

### LOCATION

**Location:** Altiplano Bolivia, Bolivia, Plurinational State of

**No. of Technology sites analysed:**

**Geo-reference of selected sites**

- n.a.

**Spread of the Technology:**

**In a permanently protected area?:**

**Date of implementation:** more than 50 years ago (traditional)

**Type of introduction**

- through land users' innovation
- as part of a traditional system (> 50 years)
- during experiments/ research
- through projects/ external interventions

### CLASSIFICATION OF THE TECHNOLOGY

#### Main purpose

- improve production
- reduce, prevent, restore land degradation
- conserve ecosystem
- protect a watershed/ downstream areas – in combination with other Technologies
- preserve/ improve biodiversity
- reduce risk of disasters
- adapt to climate change/ extremes and its impacts
- mitigate climate change and its impacts
- create beneficial economic impact
- create beneficial social impact

#### Land use



#### Cropland

- Annual cropping: cereals - quinoa or amaranth
- Number of growing seasons per year: 1

#### Water supply

- rainfed
- mixed rainfed-irrigated
- full irrigation

#### Purpose related to land degradation

- prevent land degradation
- reduce land degradation
- restore/ rehabilitate severely degraded land
- adapt to land degradation
- not applicable

#### Degradation addressed

#### SLM group

Wocat SLM Technologies

#### SLM measures

Revalorización de saberes ancestrales para la siembra de quinua

1/5



## TECHNICAL DRAWING

### Technical specifications

## ESTABLISHMENT AND MAINTENANCE: ACTIVITIES, INPUTS AND COSTS

### Calculation of inputs and costs

- Costs are calculated:
- Currency used for cost calculation: **Bolivianos**
- Exchange rate (to USD): 1 USD = 6.96 Bolivianos
- Average wage cost of hired labour per day: n.a

### Most important factors affecting the costs

n.a.

### Establishment activities

n.a.

### Establishment inputs and costs

Specify input	Unit	Quantity	Costs per Unit (Bolivianos)	Total costs per input (Bolivianos)	% of costs borne by land users
<b>Plant material</b>					
Semillas	kg	6.0	60.0	360.0	100.0
<b>Total costs for establishment of the Technology</b>				<b>360.0</b>	
<i>Total costs for establishment of the Technology in USD</i>				<i>51.72</i>	

### Maintenance activities

n.a.

## NATURAL ENVIRONMENT

### Average annual rainfall

- < 250 mm
- 251-500 mm
- 501-750 mm
- 751-1,000 mm
- 1,001-1,500 mm
- 1,501-2,000 mm
- 2,001-3,000 mm
- 3,001-4,000 mm
- > 4,000 mm

### Agro-climatic zone

- humid
- sub-humid
- semi-arid
- arid

### Specifications on climate

Boreal. No es el más adecuado para el altiplano, pero se acerca

### Slope

- flat (0-2%)
- gentle (3-5%)
- moderate (6-10%)
- rolling (11-15%)
- hilly (16-30%)
- steep (31-60%)
- very steep (>60%)

### Landforms

- plateau/plains
- ridges
- mountain slopes
- hill slopes
- footslopes
- valley floors

### Altitude

- 0-100 m a.s.l.
- 101-500 m a.s.l.
- 501-1,000 m a.s.l.
- 1,001-1,500 m a.s.l.
- 1,501-2,000 m a.s.l.
- 2,001-2,500 m a.s.l.
- 2,501-3,000 m a.s.l.
- 3,001-4,000 m a.s.l.
- > 4,000 m a.s.l.

### Technology is applied in

- convex situations
- concave situations
- not relevant

### Soil depth

- very shallow (0-20 cm)
- shallow (21-50 cm)
- moderately deep (51-80 cm)
- deep (81-120 cm)
- very deep (> 120 cm)

### Soil texture (topsoil)

- coarse/ light (sandy)
- medium (loamy, silty)
- fine/ heavy (clay)

### Soil texture (> 20 cm below surface)

- coarse/ light (sandy)
- medium (loamy, silty)
- fine/ heavy (clay)

### Topsoil organic matter content

- high (>3%)
- medium (1-3%)
- low (<1%)

### Groundwater table

- on surface
- < 5 m
- 5-50 m
- > 50 m

### Availability of surface water

- excess
- good
- medium
- poor/ none

### Water quality (untreated)

- good drinking water
  - poor drinking water (treatment required)
  - for agricultural use only (irrigation)
  - unusable
- Water quality refers to:

### Is salinity a problem?

- Ja
- Nee

### Occurrence of flooding

- Ja
- Nee

### Species diversity

- high
- medium
- low

### Habitat diversity

- high
- medium
- low

## CHARACTERISTICS OF LAND USERS APPLYING THE TECHNOLOGY

**Market orientation**

- subsistence (self-supply)
- mixed (subsistence/ commercial)
- commercial/ market

**Off-farm income**

- less than 10% of all income
- 10-50% of all income
- > 50% of all income

**Relative level of wealth**

- very poor
- poor
- average
- rich
- very rich

**Level of mechanization**

- manual work
- animal traction
- mechanized/ motorized

**Sedentary or nomadic**

- Sedentary
- Semi-nomadic
- Nomadic

**Individuals or groups**

- individual/ household
- groups/ community
- cooperative
- employee (company, government)

**Gender**

- women
- men

**Age**

- children
- youth
- middle-aged
- elderly

**Area used per household**

- < 0.5 ha
- 0.5-1 ha
- 1-2 ha
- 2-5 ha
- 5-15 ha
- 15-50 ha
- 50-100 ha
- 100-500 ha
- 500-1,000 ha
- 1,000-10,000 ha
- > 10,000 ha

**Scale**

- small-scale
- medium-scale
- large-scale

**Land ownership**

- state
- company
- communal/ village
- group
- individual, not titled
- individual, titled

**Land use rights**

- open access (unorganized)
- communal (organized)
- leased
- individual

**Water use rights**

- open access (unorganized)
- communal (organized)
- leased
- individual

**Access to services and infrastructure**

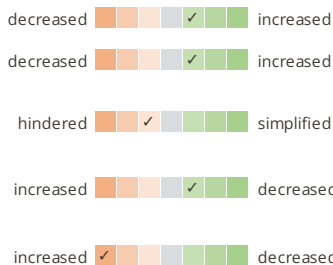
- health
- education
- technical assistance
- employment (e.g. off-farm)
- markets
- energy
- roads and transport
- drinking water and sanitation
- financial services



**IMPACTS**

**Socio-economic impacts**

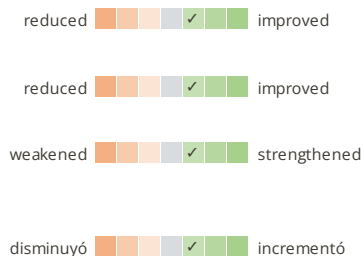
- Crop production
- production area (new land under cultivation/ use)
- land management
- expenses on agricultural inputs
- workload



Tiempo en su recuperación  
 Abono  
 El incremento es bastante elevado

**Socio-cultural impacts**

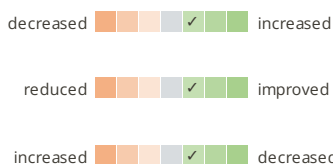
- food security/ self-sufficiency
- cultural opportunities (eg spiritual, aesthetic, others)
- community institutions
- Contribución al bienestar humano



Garantizar la alimentación a la comunidad  
 Recuperación de saberes ancestrales  
 Revalorización de conocimientos ancestrales  
 El cultivo tradicional de quinua contribuye al rescate y revalorización de técnicas y saberes ancestrales para el desarrollo productivo armónico con el medio ambiente.

**Ecological impacts**

- water quantity
- harvesting/ collection of water (runoff, dew, snow, etc)
- surface runoff



Incremento de la retención del agua en el suelo  
 Cosecha de agua  
 Evita la erosión del suelo

evaporation	increased	decreased	Se evita la evaporación
soil moisture	decreased	increased	Retención de la humedad
soil cover	reduced	improved	Formación de pasturas
salinity	increased	decreased	Recuperación de la materia orgánica
soil organic matter/ below ground C	decreased	increased	Formación de pasturas
biomass/ above ground C	decreased	increased	Mayor cobertura vegetal
plant diversity	decreased	increased	Incremento de ganados en la zona
animal diversity	decreased	increased	Mitigación del cambio climático
emission of carbon and greenhouse gases	increased	decreased	Regeneración de pasturas
wind velocity	increased	decreased	
Recuperación de la fertilidad del suelo	diminuyó	incrementó	

## Off-site impacts

### COST-BENEFIT ANALYSIS

Benefits compared with establishment costs

Benefits compared with maintenance costs

### CLIMATE CHANGE

### ADOPTION AND ADAPTATION

Percentage of land users in the area who have adopted the Technology

- single cases/ experimental
- 1-10%
- 11-50%
- > 50%

Of all those who have adopted the Technology, how many have done so without receiving material incentives?

- 0-10%
- 11-50%
- 51-90%
- 91-100%

Has the Technology been modified recently to adapt to changing conditions?

- Ja
- Nee

To which changing conditions?

- climatic change/ extremes
- changing markets
- labour availability (e.g. due to migration)

### CONCLUSIONS AND LESSONS LEARNT

Strengths: land user's view

Strengths: compiler's or other key resource person's view

- La interacción de saberes ancestrales con la tecnología contemporánea.
- La producción tradicional es menos riesgosa en la productividad de la quinua.
- Se recupera cobertura vegetal.

Weaknesses/ disadvantages/ risks: land user's view how to overcome

Weaknesses/ disadvantages/ risks: compiler's or other key resource person's view how to overcome

- Lleva más tiempo realizar la siembra manual.

## REFERENCES

### Compiler

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### Full description in the WOCAT database

[https://qcat.wocat.net/af/wocat/technologies/view/technologies\\_1237/](https://qcat.wocat.net/af/wocat/technologies/view/technologies_1237/)

### Linked SLM data

n.a.

### Documentation was facilitated by

Institution

- n.a.

Project

- n.a.

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